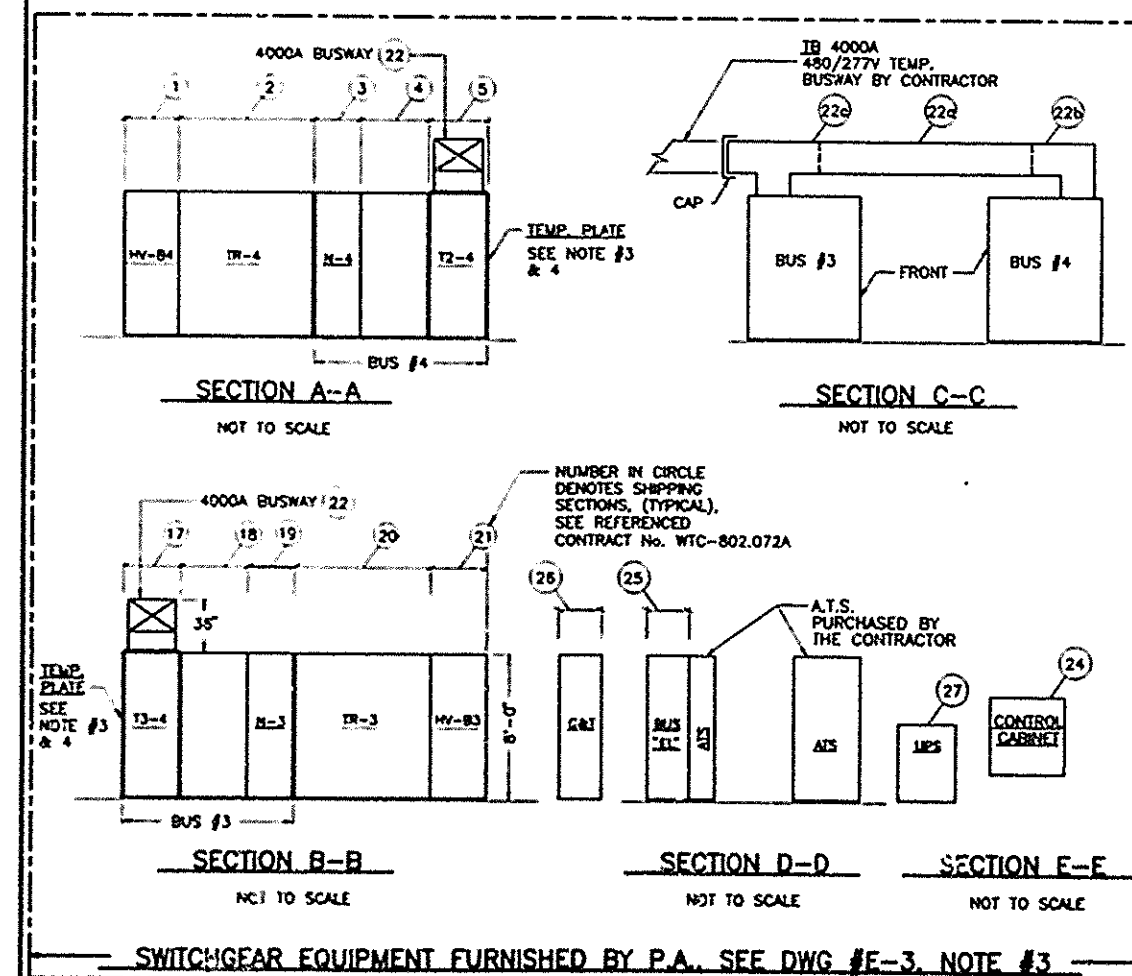
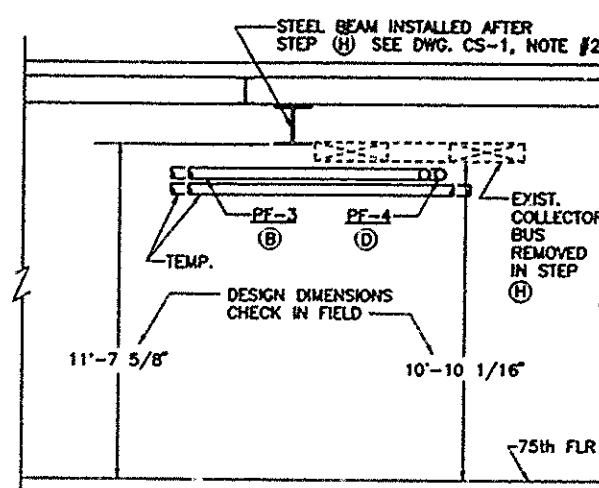


TYPICAL PLAN - SUBSTATION SS-75N  
 (OTHER SUBSTATIONS SIMILAR)

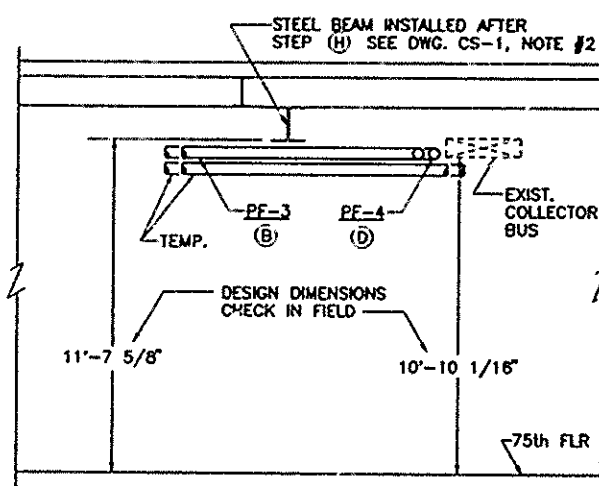
SCALE IN FEET  
 0 4 8 12 16



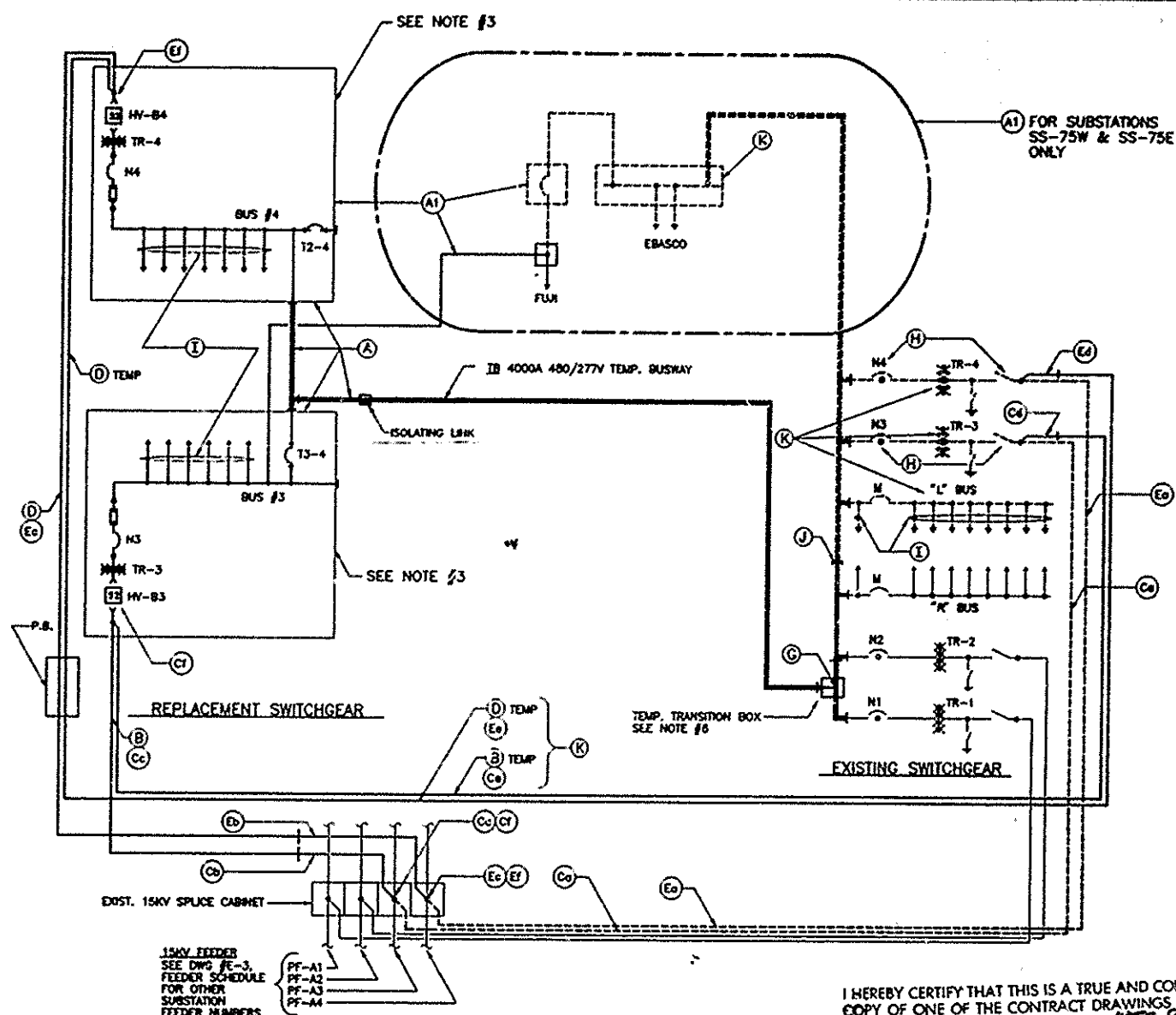
SWITCHGEAR EQUIPMENT FURNISHED BY P.A. SEE DWG #E-3, NOTE #3



SECTION F-F  
 FOR SUBSTATIONS SS-75W & SS-75E ONLY



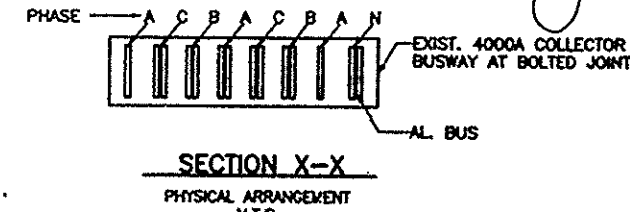
SECTION F-F  
 ALL SUBSTATIONS EXCEPT SS-75W & SS-75E



ONE LINE DIAGRAM - SUBSTATION SS-75N  
 (OTHER SUBSTATIONS SIMILAR)

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF ONE OF THE CONTRACT DRAWINGS CONSTITUTING A PART OF CONTRACT NO. WTC-802.071 IN THE FORM IN WHICH SAID DRAWINGS EXISTED AT THE TIME THE SAID CONTRACT WAS EXECUTED BY THE PARTIES.

DATE 6/21/95 *Santhan A. Aslam* WRITER  
 DATE 8/15/95 *Peter K. Sweeney* ENGINEER OF DESIGN



NOTES:

- FOR LEGEND SEE DWG #E-1, FOR GENERAL NOTES AND ABBREVIATIONS SEE DWG #E-2.
- THIS DWG TOGETHER WITH DWG #CS-1 DESCRIBES IN GENERAL THE STAGE II SEQUENCE OF INSTALLATION FOR A TYPICAL SUBSTATION. FOR DETAILS SEE INDIVIDUAL SUBSTATION DRAWINGS PLUS OTHER TYPICAL DRAWINGS.
- TEMPORARY STEEL PLATES INSTALLED BY THE SWITCHGEAR MANUFACTURER, COVERING OPENINGS BETWEEN THE BREAKER SECTIONS SHALL REMAIN IN PLACE FOR SAFETY DURING STAGE II.
- THE SWITCHGEAR MANUFACTURER INSTALLED TEMPORARY JUMPERS IN PLACE OF ELECTRIC INTERLOCKING CONTACTS FROM BKR. HY-B1, HY-B2, T1-2 & T1-3 NOT INSTALLED IN STAGE II. THESE JUMPERS SHALL BE REMOVED AND CONTACTS TO BE ADDED TO BKR CKTS IN STAGE III.
- PRIOR TO ENERGIZING BUS #3 AND 4 THE CONTRACTOR SHALL INSTALL THE FOLLOWING:
  - ALL CONDUITS ENTERING SWITCHGEAR
  - ALL BUSWAY SECTIONS ENTERING SWITCHGEAR
  - ALL FEEDERS RUN TO LOADS OR SPLICING POINTS.
- AN ADDITIONAL OUTAGE B SHALL BE MADE TO ALLOW THE CONTRACTOR TO FIELD MEASURE CONNECTION POINTS AT THE COLLECTOR BUS FOR DESIGN OF TEMPORARY CONNECTION (SEE SECTION "D-D", DWG #E-14, 28, 42, 56, 71, & 86)
- ALL ELECTRICAL OUTAGES SHALL BE PERFORMED OUTSIDE NORMAL BUILDING OPERATING HOURS. SEE SPECIFICATIONS DIVISION 1 ENTITLED "CONDITIONS AND PRECAUTIONS" FOR DESCRIPTION OF ELECTRICAL POWER OUTAGE CATEGORIES.
- ZONE GROUND FAULT SYSTEM SHALL REMAIN INOPERABLE DURING STAGE II.

SEQUENCE OF INSTALLATION STAGE II (SEE NOTE #2 AND 5)			
STEP	DESCRIPTION OF WORK	OUTAGE AT SUBSTATION (SEE NOTE #2) CATEGORY      LOAD LOST	REMARKS
A	INSTALL BUS #3 & 4 WITH ASSOCIATED EQUIPMENT & TEMPORARY 480/277V BUSWAY TO EXIST. SWITCHGEAR. INSTALL EL. BUS WITH A.T.S. INSTALL TEMPORARY UPS	- 0 -      - 0 -	HOLD CONNECTION OF TEMPORARY BUS AT EXIST. SWITCHGEAR END.
B	INSTALL CDT. PF-A3 FROM HY-B3 TO EXISTING 15KV. SPLICE CABINET, AND CDT. PF-A3 TEMP. FROM HY-B3 TO EXIST. TR-3	- 0 -      - 0 -	END CDT. SHORT OF SPLICE CABINET & EXIST. TR-3.
C	a. REMOVE EXIST'G PF-A3 CDT. & CABLE FROM SPLICE CABINET TO EXISTING SWITCHGEAR. b. EXTEND CDT. PF-A3 TO EXISTING 15KV. SPLICE CABINET. c. INSTALL FDR. PF-A3, SPLICE & CONNECT. d. EXTEND CDT. PF-A3 TEMP. TO EXIST. TR-3 e. INSTALL FDR. PF-A3 TEMP. & CONNECT f. TEST & ENERGIZE FEEDER PF-A3, RE-ENERGIZE EXIST. TR-3.	D      - 0 -	DE-ENERGIZE FDR PF-A3 AND KEEP OUT OF SERVICE FOR DURATION OF STEP C. (THE 3 REMAINING FEEDERS WILL SUPPLY 1/2 OF THE TOWER) BKR. HY-B3 TO BE LOCKED OPEN AFTER TEST.
D	INSTALL CDT. PF-A4 FROM HY-B4 TO EXISTING 15KV. SPLICE CABINET, AND CDT. PF-A4 TEMP. FROM HY-B4 TO EXIST. TR-4	- 0 -      - 0 -	END CDT. SHORT OF SPLICE CABINET & EXIST. TR-4.
E	a. REMOVE EXIST'G PF-A4 CDT. & CABLE FROM SPLICE CABINET TO EXISTING SWITCHGEAR. b. EXTEND CDT. PF-A4 TO EXISTING 15KV. SPLICE CABINET. c. INSTALL FDR. PF-A4, SPLICE & CONNECT. d. EXTEND CDT. PF-A4 TEMP. TO EXIST. TR-4 e. INSTALL FDR. PF-A4 TEMP. & CONNECT f. TEST & ENERGIZE FEEDER PF-A4, RE-ENERGIZE EXIST. TR-4.	D      - 0 -	OPEN EXIST. TR-4 NETWORK PROTECTOR & LOCK OUT OF SERVICE. DE-ENERGIZE FDR PF-A4 & KEEP OUT OF SERVICE FOR DURATION OF STEP F. (THE 3 REMAINING FEEDERS WILL SUPPLY 1/2 OF THE TOWER) BKR. HY-B4 TO BE LOCKED OPEN AFTER TEST.
F	COMMISSION BUS #3 & 4 LINE-UPS (SEE NOTE #5)	- 0 -      - 0 -	SEE SPEC. SECTION 16999 FOR COMMISSIONING PROCEDURE
G	MAKE TEMPORARY 480/277V BUSWAY CONNECTION AT EXIST. COLLECTOR BUS	C      NO POWER TO SUBSTATION	OPEN EXIST. BKR. N1,2,3,4 & HY-B3, HY-B4. (SEE NOTE #5 & 6)
H	a. OPEN EXIST'G 15KV. NETWORK PROTECTOR AND PRIMARY DSC. SW. - CLOSE BKR. HY-B3. b. (REPEAT a. FOR EXIST. TR-4 & HY-B4.)	- 0 -      - 0 -	NEWLY INSTALLED EQUIP. WILL SUPPLY LOADS WITH EXIST. TR-3 & TR-4 ACTING AS BACK-UP.
I	TRANSFER LOADS FROM EXIST. "L" BUS TO BUS 3 & 4, REMOVE EXIST. FDR'S.	A, B OR C      NO POWER TO LOADS BEING TRANSFERRED	APPROX. 11 LOADS
J	DISCONNECT COLLECTOR BUSWAY, REMOVE HALF & CAP END.	A OR B      NO POWER TO SUBSTATION EXCEPT LOADS ON BUS #3	OPEN BKR. N1, N2, N3, N4 & T3-4
K	REMOVE FDRS. PF-A3 TEMP. & PF-A4 TEMP. REMOVE EXIST. "L" BUS, TRANSFORMER #TR-3 & TR-4 WITH ASSOCIATED EQUIPMENT	C      - 0 -	SAME REMARKS AS C & D ABOVE
- SEQUENCE FOR SS-75W & SS-75E ONLY -			
A	PERFORM STEPS B, C, D & E FOR BUS #3 LINE-UP WITHOUT INSTALLING BUS #4 UNTIL FIRST TRANSFERRING FULL LOAD FEEDER TO BUS #3 & REMOVING EXIST. FUJI EQUIPMENT	A OR B      NO POWER TO LOADS BEING TRANSFERRED	CONTINUE STEPS I TO K ABOVE

THE PORT AUTHORITY  
 OF NY & NJ

*Peter K. Sweeney*  
 ENGINEERING PROGRAM MANAGER  
 WORLD TRADE CENTER  
*Santhan A. Aslam*  
 CHIEF ELECTRICAL ENGINEER

Engineering Department  
 Design Division

The World Trade  
 Center  
 Electrical/HVAC  
 Upgrade Program

TOWER ONE AND TWO  
 LOW VOLTAGE  
 SUBSTATIONS  
 CONSTRUCTION AND  
 INSTALLATION

ELECTRICAL

TYPICAL SUBSTATION  
 STAGE II  
 INSTALLATION OF  
 BUS #3 & 4

No. Date Revision Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

LEAHY/  
 FISCHER  
 Designed by  
 LEAHY  
 Drawn by  
 A.S.  
 Checked by

Date 5-1-95 Scale AS NOTED

Contract Number  
 WTC 802.071  
 Drawing Number  
 E-5